

1 VI. CLAIMS

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3 What is claimed is:

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5 1. A section mill for oil wells having a casing, comprising:

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7 A) an elongated cylindrical assembly coaxially extending within a  
8 casing and having first and second ends and including a first  
9 central through opening and said cylindrical assembly having  
10 first and second apertures at first and second predetermined  
11 distances, respectively, from said first end, said first  
12 predetermined distance being greater than said second  
13 predetermined distance;

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15 B) means for applying a pressurized fluid to said second end;

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17 C) a first tubular shaft assembly having third and fourth ends and  
18 including a second central through opening and said first  
19 tubular shaft assembly being coaxially housed within said  
20 cylindrical assembly and further including a first teathed  
21 portion at a third predetermined distance from said third end  
22 and said fourth end being exposed to said pressurized fluid  
23 urging said first tubular shaft assembly toward said first end;

24  
25 D) a second tubular shaft assembly having fifth and sixth ends and  
26 including a third central through opening and said second  
27 tubular shaft assembly being coaxially housed within said first  
28 tubular shaft assembly and further including second teathed

1 portion at a fourth predetermined distance from said fifth end  
2 and said sixth end being exposed to said pressurized fluid  
3 urging said second tubular shaft assembly toward said first  
4 end;

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6 E) first blade means pivotally mounted to said cylindrical  
7 assembly within said first aperture and cooperatively adapted  
8 to coact with said first teathed portion, said first blade means  
9 including at least one first blade member selectively movable  
10 between two extreme first and second positions, said first  
11 position being in substantial coaxial alignment with said  
12 cylindrical assembly and said second position being  
13 substantially perpendicular to, and protruding radially  
14 outwardly through, said cylindrical assembly and said first  
15 blade member including a smooth corner that comes in slidable  
16 contact with said casing when urged to said second position so  
17 that said first at least one blade member is allowed to fully  
18 distend only when the section mill advances downwardly a  
19 third predetermined distance;

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21 F) second blade means pivotally mounted to said cylindrical  
22 assembly within said second aperture and cooperatively  
23 adapted to coact with said second teathed portion, said second  
24 blade means including at least one second blade member  
25 selectively movable between two extreme first and second  
26 positions, said first position being in substantial coaxial  
27 alignment with said cylindrical assembly and the other position  
28 being substantially perpendicular to, and protruding radially

1 outwardly through, said cylindrical assembly so that said at  
2 least one second blade member is brought in operational  
3 cutting contact with said casing;  
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5 G) first spring bias means to urge said fourth end towards said  
6 second end and overcome by the application of a source of  
7 pressurized fluid through said cylindrical assembly coacting  
8 against said fourth end of said first tubular shaft assembly so  
9 that at least one of said first blade members is urged against  
10 said casing and said first blade members being allowed to  
11 distend towards said second position only when said section  
12 mill advances a predetermined distance and there is no casing;  
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14 H) second spring bias means to urge said sixth end towards said  
15 second end and overcome by the application of a source of  
16 pressurized fluid through said cylindrical assembly coacting  
17 against said sixth end of said second tubular shaft assembly so  
18 that at least one of said second blade members is brought  
19 against said casing in cutting contact therewith thereby starting  
20 the cutting operation.  
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22 I) first packing means for sealing said cylindrical assembly within  
23 respect to said first shaft means.  
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25 J) second packing means for sealing said first shaft means with  
26 respect to said second shaft means; and  
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1        2.     The section mill for oil wells set forth in claim 1 wherein said  
2        first and second teathed portions have a triangular cross-section.

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4        3.     The section mill for oil wells set forth in claim 2 wherein said  
5        first and second blade members include at least one supporting plate  
6        sandwiched by a layer of abrasive material.

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8        4.     The section mill for oil wells set forth in claim 3 wherein said  
9        abrasive material is tungsten carbide.